

Flowmeter Comparison		
Measurement method	Transit Time (insert or clamp on sensors)	Cross Correlation (wedge or insert sensors)
Product group	Ultrasonic	Ultrasonic
Measuring technology	Measures the running time of ultrasound pulses, in and against the flow direction	Measures (scans) the particle velocity in the flow through area to detect the actual flow profile
Graphical representation	Transit Time insertion sensors 	Cross Correlation wedge sensors
	Transit Time clamp on sensors <p>Note: Glass fiber plastic tubes, linings and solids in the fluid inhibit the signal quality</p>	Cross Correlation insertion pipe sensors <p>Note: No loss of quality through pipe materials and solids</p>
Result	The exact average path velocity	Getting the particles velocity distribution over the complete flow cross-section
Requirements for the measuring point	The liquid should not contain many solids and/or particles	The liquid should contain particles.
Typical applications	Clear water/liquids, potable water, hydropower	Solids and particles-containing water, dirty liquids
Uncertainty laboratory test	Path velocity $\pm 0,5\%$, condition, clean water with almost no particles	Correlated, particle velocity over the whole cross section $\pm 0,5\%$
Diagnostics	No direct information about the flow profile	Direct measurement of the flow profiles
Deposits in the pipe or channel	Not recognizable	Optionally possible
Expected site accuracy	Depending on the application. Multiple paths (more sensors) increase accuracy. Number of paths will be decided from case to case	Depending on the application. Few sensors increase accuracy. Number of sensors, will be decided from case to case
Installation	Sensor pair assembly must be calibrated	Single sensor, no alignment required
Approvals	According IEC 60041, WRAS BS6920...	According MCERTS, ATEX II 2 Gex ib IIB T4 Gb
Transmitter		
Measurement range	flow velocity ± 20 m/s	-100 cm/s to +600 cm/s
Meas. uncertainty	flow velocity ($v_{average}$) ± 0.1 % of measurement value within path	< 1 % of measurement value ($v > 1$ m/s)(per scan layer) < 0.5 % of measurement value +5 mm/s ($v < 1$ m/s)
Sensors	up to 32 paths corresponding 64 sensors	up to 9 sensors

Instrumentation For Water Industry

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